

Smart Home Controller using Node MCU Based on IOT

Rakshitha S.; Tejaswini S V.; Tharun S.; Chithra H.; Ankitha A
Vemana Institute of Technology

Abstract: - A new technology has been evolved such that all the electronic gadgets and the cell phones can be controlled without use of any gadgets. A new automation system with respect to home has been evolved whereas normal house can be controlled with a plan by accessing the distance that has been introduced. Nowadays many modern houses will be fully furnished with upcoming electronic devices. Also, many conventional halls where all the switches will be located in various parts which will be very difficult in order to go near the switches and operate also it is very difficult for the people who are aged and also for the people who are handicapped. To overcome this an Internet of Things makes a daily life very easy so that a new system can be evolved. A new system is developed in our project that is home automation system which is completely wireless this wireless automation system is developed using IoT where it uses many computers and sometimes mobile devices in order to control some of the basic functions and other features automatically through the help of Internet from anywhere in the home or anywhere a person is located. This system sometimes can also be called as a smart home. This project helps the user to save his time in order to control many devices and also the very advantage of this project is he or she or any old age people can also control this electronic device without any help.

Keywords:- Internet of Things, Gadgets, Automation System.

I. INTRODUCTION

The automation that is used in work activities of many home appliances are helpful in many other ways it also has some of the electrical devices which are interconnected with each other. The main aspect of this is installing in the home, which is a significant challenge that becomes a problem for the service. This automation system is also having an integrated system with a communication purpose which is having a high energy efficiency and some of the safety benefits. Nowadays advancement in many wireless technologies have introduced a very big difference in GSM Wi-Fi and Bluetooth models. All these models which are connected to each other may have many advantages and all these models can be controlled by the help of Android phone only. Although it is observed that average all the houses are developed with home automation system. This system will be eco-friendly and it gives many solutions to the home problems and also it saves time.

The home automation system has given many advantages in terms of time and it reduces a person to overcome his problems and he can work peacefully. The home automation system which is used in our project mainly uses electrical appliances which is an eco friendly. Whatever the commands required all the commands will be sent with the help of Bluetooth to the arduino board. This communication will help to switch the device on and off while a person is working or when he is doing any other work. Our project contains combination of embedded system and a mobile technology which involves the Android applications. This also results in establishing a connection between the hardware and software using many modern technologies. Many users can also control this home appliances using their Android mobiles. To use this application a person who wants this to work he or she should install the Android mobile in various home applications. This project is also related to automation which is related to the first generation. Primary generation implementation takes place when it must be connected through various web users and also it has to be managed in mainly the remote places.



Fig. 1: Home Automation

A. Objectives

There are many objectives for this smart automation systems. Some of the main objectives that is listed in our project is given below.

- It is used to control the home appliances and to monitor what is inside the home.
- Mainly used to save our time and utilize the energy for efficient purpose.

B. Scope of Work

There are various scope if we implement Home Automation in our daily life. Some of those are listed below.

- **Savings:** This smart automation system will help us to save energy and also it will save the cost and the time. This home automation technologies monitor over several usage of water and also prevents the high cost of bill.
- **Convenience:** This project is completely home automation all the tasks can be done very easily without any strain or stress. So this automation system requires a lot of task and it also have a several smart gadgets which is compared to one another also it triggers between many devices and also home processors.
- **Controlling:** This project has a very good advantage in controlling all the features that is related to home appliances. With this advanced technology also, an individual can know what is happening inside the home whenever he or she is outside the home also and they can also monitor from where they are.
- **Piece of mind:** The primary goal of this project is to give customers a piece that allows them to be in a relaxed state, ensuring that their home is safe.

II. LITERATURE REVIEW

A. Rich Picking, " Home Automation System By Using Remote Control By Having a Different Network Technologies", version 2015

This this paper mainly describes about how a device can be controlled by fully automatically using a remote it also had a problem in the implementation part also in the network technologies and indicated how to optimize these systems. The customized automation existed in many years. This began with a student who had two electric wires he connected the electric wires to the hand and off an alarm clock so that it becomes a closed circuit which is a combination of battery and bulb. The main advantages and the usage of this was predicted and in the end in the year 1998 the domestic project was coined. This became a biggest issue and it was accessible to all the users which was a disadvantage.

B. Patel Pooja, Patel Mitesh, " Controlling A Home Using ESP 8266 And IOT", version 2016

In this paper a new technology was used which is having a cloud computing and also a communication with the Internet with the help of embedded system. In this project a model was developed such that a smart home automation system was developed. The advance stage in this project involved the information technologies and many computer sciences across many reasonable for low cost and also efficient power which made all the devices to be accessible and it become a practical knowledge in every domain. The main usage of this Internet Protocol developed in many million clear which was very cheap and affordable to the many users. The sensors used in this technology was a service provided with the help of an Amazon cloud in order to create a new system which is completely automated which is smart automation systems. The main drawback or the disadvantage was whenever a router is you know

available then the system was easily accessible or attacked by anyone.

C. Ganesh Aishwarya ,Pooja , "Automation System Using Node MCU And Applications Of Blanket", version November 2020

This system was developed using IoT where it uses many systems computers and other mobile devices in order to control many features automatically with the help of Internet which is called as a smartphone. This technology helped to save electric power human energy also. This technology used internet of things which was an upcoming technology which allows users to access all the data through the internet which is connected to a hardware. An IoT device was proposed in this project to control all home appliances and automation systems using the internet Full Storm.

D. Shubham Kulkarni Sing Grab Deep, " MCU Based Automation System Fully Smart", version December 2018

This this paper mainly describes about the technology of home automation system and about upcoming technology and significant advancement. And it also accepted home automation, which was completely high cost. A, it also added many additional networks which includes hub which was in working position and also node MCU and many IoT platforms. This made a cost a little bit efficient by having an application with greater advantage the system was very independent and there was number need for any particular operating system.

E. Pratham Gaurav, Shubham, "Fully Atomated System Based On NCU Node", version 2021

The system developed in this project was fully flexible and it was completely automated while having some of the additional microcontroller features which was connected through a Wi-Fi and many controlling devices. The proposed system had a very good advantage over many independent and several usage of Internet of Things this also monitors and controls the electrical and electronic systems which was completely interfaced between the hardware and many user components. This microcontroller based project had many component requirements which was fully aware of smart automation system. A micro web server which was used in mainly in application layer and made establishing a connection between the user and home , mini security System. This enabled blink installed app in many other smartphone devices. With this a user was available to operate using various sensors from where he is working or they can also control and monitor.

F. Sounder and Deepa. "Automation based system using Internet of Things", version 2022

This system had a current development in many technologies and it was given a permission to use many models such as Bluetooth and other Wi-Fi devices. By using many Wi-Fi devices a micro based server which was having a very low cost and also enables a person to work using a device. It is also very efficient in order to control the individual from low-cost available component and also to

use many security lamps other television air conditioning system and other house lighting systems.

III. ARCHITECTURAL DESIGN FOR PROPOSED SYSTEM

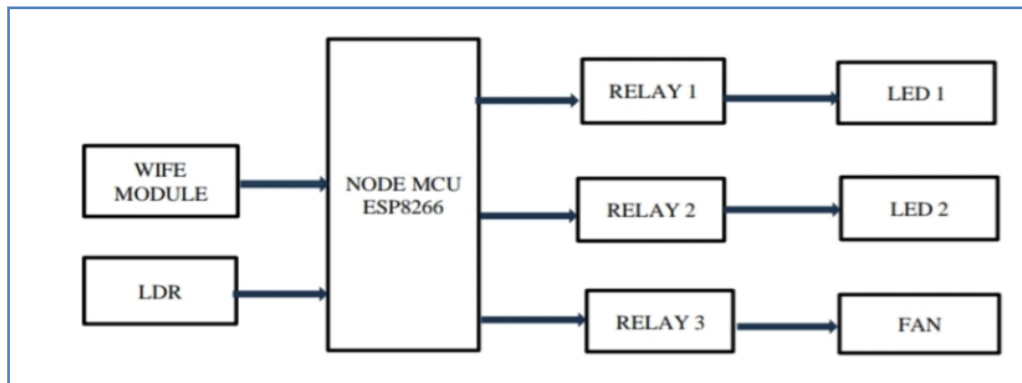


Fig. 2: Proposed system block diagram

The figure 2 shows the block diagram of the proposed methodology. This block diagram consists of a Wi-Fi module, LDR relay unit, LED fan and node MCU ESP 8266 microcontroller processor. The NTU is having a + 5 volts of voltage and ground pins connected to a breadboard which is shown in the above figure. Wi-Fi module is connected to a 5 Volt relay and also ground pins are connected to the breadboard. The Wi-Fi is having a voltage of 5 Volt, which is connected to a voltage which generates an voltage of 3.3 volts and it is connected to a transmitter. The working is explained by considering whenever a relay is in off mode the bulb of the NC terminal will be on and the relay will not

be recognized. Whenever you want to turn the bulb on, it can be done with the help of sending a signal by using our smartphone. Whenever there is no load connected then the relay is powered up from the Arduino board and also the switches are connected with the NC terminal.

This IoT helps you to permit and connect many devices which is located in any place and all over the network areas. The home automation system mainly controls appliances both mechanically and this technique is mainly connected with the help of the main three units that will generate it has a wireless technology.

A. Node MCu ESP 8226

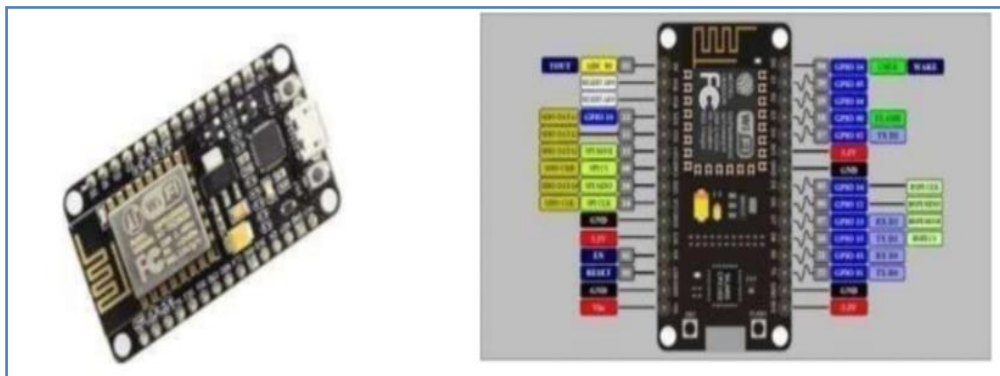


Fig. 3: Node MCu ESP 8226

This board is almost an open source software which is developed by using an ESP 826 microcontroller Chip. This microcontroller based board consists of an Wi-Fi enabled model also which is having a very low cost and TCP IP protocol which is shown in the above figure.

- The kit mainly consists of eight analog pins and eight digital pins on the board
- It also consists of a serial communication port
- 128 KB RAM
- It is having a total 80 milliampere of operating current
- It consists of 20 micro ampere sleep mode

B. Wi-Fi Module

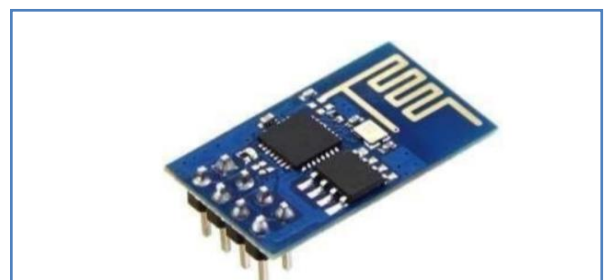


Fig. 4: Wi-Fi Module

This is mainly developed using system object it also made-up of Internet of Things which is used in the applications of analyzing the data.

It has several features

- It consists of an integrated circuit which is used in serial communication port
- It consists of an uart
- It consists of an analog to digital conversion prints which is having a total 10 bit.

C. LDR

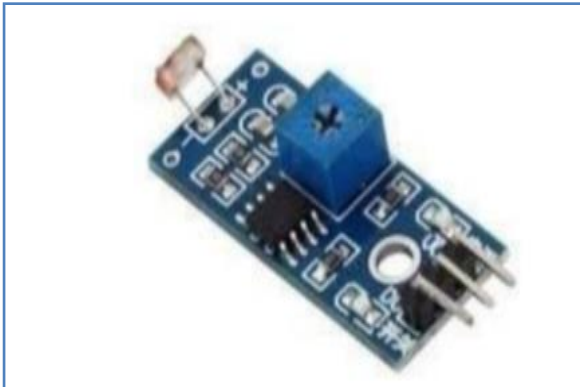


Fig. 5: LDR

It is a circuit which stop for resistance which is fully sensed circuits it is mainly used for online offering the straight lines. These devices are mainly used in photodiodes and other photo transistors. Sometimes it has a very high current up to 1,00,000 homes but the resistor value decreases.

whenever a light falls on the strip that is provided the value of the resistance decreases. Whenever there is no light then the value of the resistance will be in the order up to 10 to 15 kilo ohm which is called as dark resistance.

D. Output



Fig. 6: Input Image

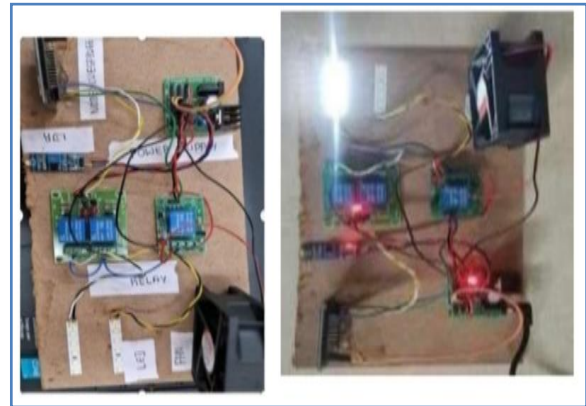


Fig. 7: System Interconnection

IV. CONCLUSION

In this project as we suggest there are many keywords used. The main thing which is used as home automation so this makes flexible and also it is very attractable to the user in order to make their work and life very easier. In this project a mobile device is integrated in order to monitor several home appliances in this a person is able to monitor data from far distance also. This project also aims in prevention of low cost also it is very accessible and auto configurable to each other. This project has achieved the goal of controlling multiple home appliances and meeting their needs and requirements.

Thus it can be concluded that an automation system design and architecture which is proposed in this project helps to prevent all the basic level of controlling the home appliances. Also this proposed system is very much better and flexible in commercial point of view also it is very cheap and flexible.

V. FUTURE SCOPE

This project has the potential to expand to encompass more home appliances using the Internet of Things in the future. Currently, it is limited to home appliances using the Internet of Things. So this project can also be extended for large area of living rooms and it can be used to monitor wherever from far away from the vacation. The possibility of home automation has no end and it can be extended in several Ways.

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